

MARKWEST

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February 7, 2017

Mr. Fred Durham, Director
West Virginia Department of Environmental Protection
Division of Air Quality
Charleston, WV 25304



**Re: MarkWest Liberty Midstream & Resources L.L.C.
Sherwood Gas Plant
Application Class II Administrative Amendment**

Dear Mr. Durham:

MarkWest Liberty Midstream & Resources L.L.C. (MarkWest) submits the enclosed application for a Class II Administrative Amendment in accordance with the West Virginia Air Pollution Control Act and Title 45 Series 13 (45CSR13) to increase the size of the HMO heaters at cryogenic plants VIII and IX at the Sherwood Gas Plant Doddridge County.

This package contains the required application forms, emissions calculations and supporting documentation for the referenced project. A check in the amount of \$300 for the application fee is included with this submittal. The public notice for the proposed construction has been sent for publication to the *Herald Record*. MarkWest will forward the Affidavit of Publication to your attention once it is received from the publisher.

MarkWest has previously been authorized to build Sherwood I-IX plants along with a deethanizer. MarkWest is not requesting any changes be made to any other existing equipment but will be submitting a full permit application in the future to add equipment requiring a 45CSR13 NSR permit application and to update some current equipment.

If you have any questions or comments, please call me (303) 542-0686 or e-mail nwheldon@markwest.com at your earliest convenience.

Sincerely,

Nathan M. Wheldon, P.E.
Environmental Manager
Enclosures (Original + Two Copies)

MarkWest
Sherwood
017-00034
13-2914E
Joe K

MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C.

SHERWOOD GAS PLANT

45CSR13 Class II Administrative Amendment

SUBMITTED TO WVDEP DIVISION OF AIR QUALITY

FEBRUARY 2017



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INTRODUCTION

MarkWest Liberty Midstream & Resources L.L.C. requests authorization to make an expansion to the Sherwood Gas Plant (R13-2914), by applying for a Class II Administrative Amendment in accordance with the West Virginia Air Pollution Control Act and Title 45 Series 13 (45CSR13).

Project Description

This administrative amendment seeks to increase the capacity of the HMO heater that is shared between plants VIII and IX. Currently the heater is permitted for a maximum heat release of 6.60 mmbtu/hr. Because the emissions from the heater are less than 6 lbs/hr and 10 tpy year the heater qualifies for a Class II Administrative Amendment. The facility is subject to the NSPS Subpart OOOO requirements for leak detection throughout.

All other equipment from the current Sherwood facility will remain as presently constituted.

Proposed Emissions

Emissions calculations for the project are presented in Attachment N. When all the equipment is installed this facility will be a Title V facility. All emissions are below the thresholds for Prevention of Significant Deterioration (PSD) analysis. Summaries of the total facility-wide emissions are presented for criteria pollutants and hazardous air pollutants (HAPs). Detailed emission calculations are also included for the new unit.

Note that additional storage tanks may be present on site (i.e., methanol, lube oil, waste oil) but are considered de minimis sources per Table 45-13B and are not addressed further in this application.

WVDEP APPLICATION FOR NSR PERMIT



WEST VIRGINIA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

**APPLICATION FOR NSR PERMIT
AND
TITLE V PERMIT REVISION
(OPTIONAL)**

PLEASE CHECK ALL THAT APPLY TO NSR (45CSR13) (IF KNOWN):

- ☐ CONSTRUCTION ☐ MODIFICATION ☐ RELOCATION
☐ CLASS I ADMINISTRATIVE UPDATE ☐ TEMPORARY
☒ CLASS II ADMINISTRATIVE UPDATE ☐ AFTER-THE-FACT

PLEASE CHECK TYPE OF 45CSR30 (TITLE V) REVISION (IF ANY):

- ☐ ADMINISTRATIVE AMENDMENT ☐ MINOR MODIFICATION
☐ SIGNIFICANT MODIFICATION

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION
INFORMATION AS ATTACHMENT S TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options
(Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant (as registered with the WV Secretary of State's Office):
MarkWest Liberty Midstream & Resources L.L.C.

2. Federal Employer ID No. (FEIN):
3 0 0 5 2 8 0 5 9

3. Name of facility (if different from above):
Sherwood Gas Plant

4. The applicant is the:
☐ OWNER ☐ OPERATOR ☒ BOTH

5A. Applicant's mailing address:
**1515 Arapahoe St., Tower 1, Suite 1600
Denver, CO 80202-2137**

5B. Facility's present physical address:
**218 Swisher Lane
West Union, WV 26456**

6. West Virginia Business Registration. Is the applicant a resident of the State of West Virginia? ☐ YES ☒ NO

- If YES, provide a copy of the Certificate of Incorporation/Organization/Limited Partnership (one page) including any name change amendments or other Business Registration Certificate as Attachment A.
- If NO, provide a copy of the Certificate of Authority/Authority of L.L.C./Registration (one page) including any name change amendments or other Business Certificate as Attachment A.

7. If applicant is a subsidiary corporation, please provide the name of parent corporation:

8. Does the applicant own, lease, have an option to buy or otherwise have control of the proposed site? ☒ YES ☐ NO

- If YES, please explain: **Applicant has purchased this property.**
- If NO, you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be constructed, modified, relocated, administratively updated or temporarily permitted (e.g., coal preparation plant, primary crusher, etc.):

Natural gas processing plant

10. North American Industry Classification System (NAICS) code for the facility:

211112

11A. DAQ Plant ID No. (for existing facilities only):
017-00034

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R13-2914

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

| | | |
|--|--|---|
| 12A. — For Modifications, Administrative Updates or Temporary permits at an existing facility, please provide directions to the <i>present location</i> of the facility from the nearest state road; — For Construction or Relocation permits , please provide directions to the <i>proposed new site location</i> from the nearest state road. Include a MAP as Attachment B . <ul style="list-style-type: none"> From Smithburg: Take US-50 East and go 2.8 miles. Turn right at Co. Route 50/35 and go 0.1 miles. Take the 1st right onto Blacklick Rd/Co Route 15/Sherwood-Greenbrier Rd and continue 0.4 miles. Site will be 0.5 miles west of Co Route 15. | | |
| 12.B. New site address (if applicable): 218 Swisher Lane, West Union, WV 26456 | 12C. Nearest city or town: Smithburg | 12D. County: Doddridge |
| 12.E. UTM Northing (KM): 4346.885 | 12F. UTM Easting (KM): 526.921 | 12G. UTM Zone: 17S |
| 13. Briefly describe the proposed change(s) at the facility: Increase the heater size of the H-8712 HMO heater for plants Sherwood VIII and IX | | |
| 14A. Provide the date of anticipated installation or change: June 2017 for the HMO Heater — If this is an After-The-Fact permit application, provide the date upon which the proposed change did happen: / / | | 14B. Date of anticipated Start-Up if a permit is granted: June 2017 |
| 14C. Provide a Schedule of the planned Installation of/Change to and Start-Up of each of the units proposed in this permit application as Attachment C (if more than one unit is involved). | | |
| 15. Provide maximum projected Operating Schedule of activity/activities outlined in this application: Hours Per Day 24 Days Per Week 7 Weeks Per Year 52 | | |
| 16. Is demolition or physical renovation at an existing facility involved? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | |
| 17. Risk Management Plans. If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your Risk Management Plan (RMP) to U. S. EPA Region III. | | |
| 18. Regulatory Discussion. List all Federal and State air pollution control regulations that you believe are applicable to the proposed process (<i>if known</i>). A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance (<i>if known</i>). Provide this information as Attachment D . | | |

| |
|---|
| Section II. Additional attachments and supporting documents. |
| 19. Include a check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR22 and 45CSR13). |
| 20. Include a Table of Contents as the first page of your application package. |
| 21. Provide a Plot Plan , e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as Attachment E (Refer to Plot Plan Guidance) . — Indicate the location of the nearest occupied structure (e.g. church, school, business, residence). |
| 22. Provide a Detailed Process Flow Diagram(s) showing each proposed or modified emissions unit, emission point and control device as Attachment F . |
| 23. Provide a Process Description as Attachment G . — Also describe and quantify to the extent possible all changes made to the facility since the last permit review (<i>if applicable</i>). |
| All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone. |
| 24. Provide Material Safety Data Sheets (MSDS) for all materials processed, used or produced as Attachment H . — For chemical processes, provide a MSDS for each compound emitted to the air. |
| 25. Fill out the Emission Units Table and provide it as Attachment I . |
| 26. Fill out the Emission Points Data Summary Sheet (Table 1 and Table 2) and provide it as Attachment J . |

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K**.

28. Check all applicable **Emissions Unit Data Sheets** listed below:

| | | |
|--|--|--|
| <input type="checkbox"/> Bulk Liquid Transfer Operations | <input type="checkbox"/> Haul Road Emissions | <input type="checkbox"/> Quarry |
| <input type="checkbox"/> Chemical Processes | <input type="checkbox"/> Hot Mix Asphalt Plant | <input type="checkbox"/> Solid Materials Sizing, Handling and Storage Facilities |
| <input type="checkbox"/> Concrete Batch Plant | <input type="checkbox"/> Incinerator | <input type="checkbox"/> Storage Tanks |
| <input type="checkbox"/> Grey Iron and Steel Foundry | <input type="checkbox"/> Indirect Heat Exchanger | |

☒ General Emission Unit, specify: **Natural gas-fired heaters**

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L**.

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

| | | |
|---|---|--|
| <input type="checkbox"/> Absorption Systems | <input type="checkbox"/> Baghouse | <input type="checkbox"/> Flare |
| <input type="checkbox"/> Adsorption Systems | <input type="checkbox"/> Condenser | <input type="checkbox"/> Mechanical Collector |
| <input type="checkbox"/> Afterburner | <input type="checkbox"/> Electrostatic Precipitator | <input type="checkbox"/> Wet Collecting System |

☐ Other Collectors, specify Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M**.

30. Provide all **Supporting Emissions Calculations** as **Attachment N**, or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O**.

➤ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and **Example Legal Advertisement** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ YES ☒ NO

➤ If YES, identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's "**Precautionary Notice – Claims of Confidentiality**" guidance found in the **General Instructions** as **Attachment Q**.

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

| | |
|--|---|
| <input type="checkbox"/> Authority of Corporation or Other Business Entity | <input type="checkbox"/> Authority of Partnership |
| <input type="checkbox"/> Authority of Governmental Agency | <input type="checkbox"/> Authority of Limited Partnership |

Submit completed and signed **Authority Form** as **Attachment R**.

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

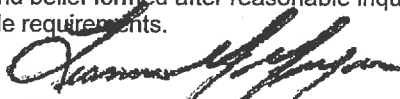
Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative**, hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____



(Please use blue ink)

DATE: _____

2/08/2017

(Please use blue ink)

35B. Printed name of signee: **Leanne Meyer**35C. Title: **Vice President EH&S**35D. E-mail: **lmeyer@markwest.com**36E. Phone: **(303) 925-9299**36F. FAX: **303-290-8769**36A. Printed name of contact person (if different from above): **Nathan Wheldon**36B. Title: **Environmental Manager**36C. E-mail: **nwheldon@markwest.com**36D. Phone: **303-542-0686**36E. FAX: **303-825-0920****PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:**

- | | |
|--|---|
| <input type="checkbox"/> Attachment A: Business Certificate | <input checked="" type="checkbox"/> Attachment K: Fugitive Emissions Data Summary Sheet |
| <input type="checkbox"/> Attachment B: Map(s) | <input checked="" type="checkbox"/> Attachment L: Emissions Unit Data Sheet(s) |
| <input checked="" type="checkbox"/> Attachment C: Installation and Start Up Schedule | <input type="checkbox"/> Attachment M: Air Pollution Control Device Sheet(s) |
| <input checked="" type="checkbox"/> Attachment D: Regulatory Discussion | <input checked="" type="checkbox"/> Attachment N: Supporting Emissions Calculations |
| <input type="checkbox"/> Attachment E: Plot Plan | <input type="checkbox"/> Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans |
| <input type="checkbox"/> Attachment F: Detailed Process Flow Diagram(s) | <input checked="" type="checkbox"/> Attachment P: Public Notice |
| <input checked="" type="checkbox"/> Attachment G: Process Description | <input type="checkbox"/> Attachment Q: Business Confidential Claims |
| <input type="checkbox"/> Attachment H: Material Safety Data Sheets (MSDS) | <input type="checkbox"/> Attachment R: Authority Forms |
| <input checked="" type="checkbox"/> Attachment I: Emission Units Table | <input type="checkbox"/> Attachment S: Title V Permit Revision Information |
| <input checked="" type="checkbox"/> Attachment J: Emission Points Data Summary Sheet | <input checked="" type="checkbox"/> Application Fee |

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ Forward 1 copy of the application to the Title V Permitting Group and:
- ☐ For Title V Administrative Amendments:
 - ☐ NSR permit writer should notify Title V permit writer of draft permit,
- ☐ For Title V Minor Modifications:
 - ☐ Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,
 - ☐ NSR permit writer should notify Title V permit writer of draft permit.
- ☐ For Title V Significant Modifications processed in parallel with NSR Permit revision:
 - ☐ NSR permit writer should notify a Title V permit writer of draft permit,
 - ☐ Public notice should reference both 45CSR13 and Title V permits,
 - ☐ EPA has 45 day review period of a draft permit.

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

APPLICATION CHECKLIST

| | |
|---|--|
| <p>A complete application is demonstrated when all of the information required below is properly prepared, completed and attached. The items listed below are required information which must be submitted with a 45CSR13 permit application. Any submittal will be considered incomplete if the required information is not included. The applicant must submit a complete application in order to receive a 45CSR13 permit.</p> | |
| ✓ | Class I legal advertisement published in a newspaper certified to accept legal advertisements and original affidavit submitted. |
| ✓ | <p>\$1,000 application fee for construction, modification, relocation or temporary permit; \$1,000 application fee for being subject to NSPS. Additional application fees:</p> <ul style="list-style-type: none"> • \$1,000 NSPS • \$5,000 Major Modification • \$2,500 NESHAP • \$10,000 Major Construction • \$2,500 45CSR27 Pollutant |
| ✓ | Original and three (3) copies of the application. |
| ✓ | File organization – application pages are numbered and in correct order, application is bound in some way, etc. |
| ✓ | Confidential Business Information is properly identified. |
| ✓ | General application forms signed by a responsible official. |
| | <p>Authority form – required if application is signed by someone other than a responsible official – one of the following:</p> <ul style="list-style-type: none"> • Authority of Corporation if application is not signed by the President or CEO; • Authority of Partnership if application is not signed by a general partner or proprietor; • Authority of Limited Partnership if application is not signed by general partner or proprietor; or • Authority of Governmental Agency if application is not signed by |

| | |
|-------------------------------------|--|
| | principal elected officer or ranking elected official. |
| <input checked="" type="checkbox"/> | Copy of current Business Registration Certificate. |
| <input checked="" type="checkbox"/> | Process description, including equipment and emission point identification numbers. |
| <input checked="" type="checkbox"/> | Process flow diagram, including equipment and emission point identification numbers. |
| <input checked="" type="checkbox"/> | Plot plan, including equipment and emission point identification numbers. |
| <input checked="" type="checkbox"/> | Area map with directions and location marked. |
| <input checked="" type="checkbox"/> | Applicable technical forms completed and submitted: <ul style="list-style-type: none"> • Emission Point Data Summary Sheets • Emission Unit Data sheets • Air Pollution Control Device Sheets • Equipment List Form |
| <input checked="" type="checkbox"/> | Emission calculations – emission factors, references, source identification numbers, etc. |

ATTACHMENT C: INSTALLATION/START-UP SCHEDULE

MarkWest Liberty Midstream & Resources intends to commence earthmoving and construction activities for the proposed Sherwood Gas Plant in Winter 2017

The final dates of installation and start-up of the proposed equipment are contingent upon the permit issuance and other factors. The currently planned starting dates for the hot oil heater is in June 2017.

ATTACHMENT D: REGULATORY DISCUSSION

MarkWest Liberty Midstream & Resources L.L.C. has reviewed the regulatory provisions and offers the following discussion regarding applicability to the proposed construction.

STATE IMPLEMENTATION PLAN (SIP):

This application does not involve a stationary source to be located in a non-attainment area subject to a SIP.

FEDERAL IMPLEMENTATION PLAN:

No Federal Implementation Plan is in effect where this stationary source is proposed.

45 CSR 4 – OBJECTIONABLE ODORS:

Normal operations of the facility are not expected to generate objectionable odors.

45 CSR 13 - PERMITS FOR CONSTRUCTION, MODIFICATION, RELOCATION AND OPERATION OF STATIONARY SOURCES OF AIR POLLUTANTS, NOTIFICATION REQUIREMENTS, ADMINISTRATIVE UPDATES, TEMPORARY PERMITS, GENERAL PERMITS, AND PROCEDURES FOR EVALUATION:

Potential emissions associated with the proposed project are greater than the minor source construction permit thresholds of 6 pounds per hour (pph) AND 10 tons per year (tpy) of any regulated air pollutant OR 144 pounds per day (ppd) of any regulated air pollutant OR 2 pph OR 5 tpy of aggregated hazardous air pollutants (HAP) OR 45 CSR 27 toxic air pollutant (TAP) (10% increase if above BAT triggers or increase to Best Available Technology (BAT) triggers) OR subject to applicable Standard or Rule.

45 CSR 14 – PREVENTION OF SIGNIFICANT DETERIORATION (PSD):

The proposed facility will not be a major source subject to the provisions of the PSD rule.

45 CSR 19 – NONATTAINMENT NEW SOURCE REVIEW:

The proposed facility will not be located in a non-attainment area.

45 CSR 22 - AIR QUALITY MANAGEMENT FEE PROGRAM:

The facility will be required to maintain a valid Certificate to Operate on the premises.

45 CSR 28 – EMISSIONS TRADING AND BANKING:

The applicant for the facility does not voluntarily choose to participate in an emission reduction credit trading program.

45 CSR 30 - REQUIREMENTS FOR OPERATING PERMITS:

Emissions from the facility will not exceed major source thresholds; therefore, this rule does not apply.

45 CSR 30-2.6.1 – EMISSIONS CAP:

This facility will not be subject to any emissions caps as provided by this provision.

45 CSR 33 – ACID RAIN:

The facility will not be a source subject to the provision of the Acid Rain program.

FEDERAL

SECTION 112(d) MACT STANDARDS:

The facility will not be a major source of hazardous air pollutants and is not subject to the MACT provisions.

SECTION 112(g) CASE-BY-CASE MACT:

The facility will not be a major source of hazardous air pollutants and is not subject to the MACT provisions.

SECTION 112 (i) EARLY REDUCTION OF HAP:

The facility will not be a major source of hazardous air pollutants and is not subject to this provision.

SECTION 112(r) RISK MANAGEMENT PLAN (RMP):

It is anticipated that the facility will maintain hazardous substances in excess of 10,000 pounds and thus will be subject to this provision.

SECTION 129 STANDARDS/REQUIREMENTS:

Operation of this facility will not involve solid waste combustion or incineration; therefore, this standard does not apply.

SECTION 183 (e) CONSUMER/COMMERCIAL PRODUCT REQUIREMENTS:

Operation of this facility will not involve the manufacture or sale of consumer or commercial products and will not be subject to this regulatory provision.

SECTION 183 (f) TANK VESSEL REQUIREMENTS:

The facility will not employ marine tank vessels; therefore, this provision does not apply.

STRATOSPHERIC OZONE (TITLE VI):

This facility will not use Class I ozone-depleting substances (ODS) including chlorofluorocarbons (CFC) and Class II ODS, which are hydrochlorofluorocarbons (HCFC), so this provision does not apply.

40 CFR PART 60 SUBPART JJJJ - STANDARDS OF PERFORMANCE FOR STATIONARY SPARK IGNITION INTERNAL COMBUSTION ENGINES:

The existing natural gas-fired compressor engines are stationary spark ignition internal combustion engines manufactured after July 1, 2007 and are subject to this subpart.

40 CFR PART 60 SUBPART OOOO – STANDARDS OF PERFORMANCE FOR CRUDE OIL AND NATURAL GAS PRODUCTION, TRANSMISSION, AND DISTRIBUTION:

This subpart establishes emission standards and compliance schedules for the control of VOC emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. As a natural gas processing plant constructed after the applicable date, the facility will be subject to requirements under this rule, as will the previously constructed plant. Storage tanks at the site will not be subject to this subpart because the emissions are less than 6 tpy per tank. Pneumatic controllers at the proposed facility will be air-driven devices to comply with the rule.

40 CFR PART 63 SUBPART ZZZZ - NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES FROM STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES:

The facility will be a minor (area) source of hazardous air pollutants (HAP). The proposed natural gas-fired engines are stationary reciprocating internal combustion engines (RICE) and will commence construction after the June 12, 2006 effective date for new stationary RICE at area sources and are therefore subject to this subpart. The engines will meet requirements by compliance with Subpart JJJJ. No further requirements apply for these engines under this subpart.

40 CFR PART 64 - COMPLIANCE ASSURANCE MONITORING:

The facility will is a major source but it not required to obtain a Part 70 or Part 71 permit, and therefore will not be an affected facility under this provision.

ATTACHMENT G: PROCESS DESCRIPTION

High pressure natural gas enters the cryogenic plants and passes through a molecular sieve to remove excess water in the gas stream. The gas then enters the cryogenic plant, which lowers the temperature of the gas in order to separate ethane and heavier hydrocarbons (Y-grade) from methane gas. After this refrigeration the gas is ready to go to market and passes through outlet compression prior to entering the downstream pipeline to a distribution pipeline operated by a separate entity. Liquids removed from the gas stream will pass through the deethanization unit to separate ethane as a purity product from the remainder of the natural gas liquid stream. Purity ethane is distributed by pipeline. Natural gas liquids are sent to pressurized storage tanks prior to transfer via pipeline to a fractionation facility.

ATTACHMENT I: EMISSION UNITS TABLE

Attachment I
Emission Units Table
(includes all emission units and air pollution control devices
that will be part of this permit application review, regardless of permitting status)

| Emission Unit ID ¹ | Emission Point ID ² | Emission Unit Description | Year Installed/Modified | Design Capacity | Type ³ and Date of Change | Control Device ⁴ |
|-------------------------------|--------------------------------|---------------------------------|-------------------------|-----------------|--------------------------------------|-----------------------------|
| CM-1001 | CM-1001 | Caterpillar G3616 LE Engine | 2012 | 4,735-hp | Existing | Oxid. Cat. |
| CM-1002 | CM-1002 | Caterpillar G3616 LE Engine | 2012 | 4,735-hp | Existing | Oxid. Cat. |
| CM-2001 | CM-2001 | Caterpillar G3608 LE Engine | 2012 | 2,370 – hp | Existing | Oxid. Cat. |
| H-711 | H-711 | Mole Sieve Regeneration Heater | 2012 | 7.86 MMbtu/hr | Existing | None |
| H-771 | H-771 | Hot Oil Heater | 2012 | 28.25 MMbtu/hr | Existing | None |
| DH-001 | DH-001 | TEG Dehydration Unit | 2012 | 120 MMscfd | Existing | Flare |
| RB-001 | RB-001 | Dehydration Unit Reboiler | 2012 | 2 MMbtu/hr | Existing | None |
| FL-991 | FL-991 | Emergency Flare | 2012 | 68,600 scf/min | Existing | N/A |
| FUG-001 | FUG-001 | Fugitive Leaks | 2012-2014 | N/A | Existing | None |
| TNK-001 | TNK-001 | Storage Tank Flashing Emissions | 2012 | N/A | Existing | VRU |
| H-2711 | H-2711 | Mole Sieve Regeneration Heater | 2013 | 7.86 MMbtu/hr | Existing | None |
| H-3711 | H-3711 | Mole Sieve Regeneration Heater | 2013 | 7.86 MMbtu/hr | Existing | None |
| H-4711 | H-4711 | Mole Sieve Regeneration Heater | 2014 | 18.00 MMbtu/hr | Existing | None |
| H-5711 | H-5711 | Mole Sieve Regeneration Heater | 2014 | 18.00 MMbtu/hr | Existing | None |
| H-6711 | H-6711 | Mole Sieve Regeneration Heater | 2015 | 18.00 MMbtu/hr | Existing | None |
| H-4712 | H-4712 | Hot Oil Heater | 2014 | 6.60 MMbtu/hr | Existing | None |
| H-6712 | H-6712 | Hot Oil Heater | 2015 | 6.60 MMbtu/hr | Existing | None |
| H-742 | H-742 | Stabilization Heater | 2014 | 2.28 MMbtu/hr | Existing | None |
| H-7711 | H-7711 | Mole Sieve Regeneration Heater | 2015 | 18.00 MMbtu/hr | Existing | None |
| H-8711 | H-8711 | Mole Sieve Regeneration Heater | 2015 | 18.00 MMbtu/hr | Existing | None |
| H-9711 | H-9711 | Mole Sieve Regeneration Heater | 2016 | 18.00 MMbtu/hr | Existing | None |
| H-8712 | H-8712 | Hot Oil Heater | 2015 | 7.20 MMbtu/hr | Modified | None |

| | | | | | | |
|----------|----------|--------------------------|------|--------------------|----------|------|
| H-2742 | H-2742 | Stabilization Heater | 2015 | 2.28 MMbtu/hr | Existing | None |
| H-3742 | H-3742 | Stabilization Heater | 2015 | 2.28 MMbtu/hr | Existing | None |
| D1-H-782 | D1-H-782 | DeEthanizer HMO Heater | 2015 | 113.36 MMbtu/hr | Existing | None |
| D1-H-741 | D1-H-741 | DeEthanizer Regen Heater | 2015 | 12.23 MMbtu/hr | Existing | None |
| H-751 | H-751 | Stabilization Heater II | 2017 | 6.35 MMbtu/hr | Existing | None |

¹ For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S,... or other appropriate designation.

² For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.

³ New, modification, removal

⁴ For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

ATTACHMENT J: EMISSION POINTS DATA SUMMARY SHEET

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

| Emission Point ID No. (Must match Emission Units Table & Plot Plan) | Emission Point Type ¹ | Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan) | | Air Pollution Control Device (Must match Emission Units Table & Plot Plan) | | Vent Time for Emission Unit (chemical processes only) | | All Regulated Pollutants - Chemical Name/CAS ³ (Speciate VOCs & HAPS) | Maximum Potential Uncontrolled Emissions ⁴ | | Maximum Potential Controlled Emissions ⁵ | | Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor) | Est. Method Used ⁶ | Emission Concentration ⁷ (ppmv or mg/m ³) |
|--|----------------------------------|--|--------|---|-------------|--|-------------|--|---|--------|---|--------|--|-------------------------------|---|
| | | ID No. | Source | ID No. | Device Type | Short Term ² | Max (hr/yr) | | lb/hr | ton/yr | lb/hr | ton/yr | | | |
| CM-1001 | Vert St Rain CP | Same | Same | N/A | Oxid. Cat. | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ Acetaldehyde Acrolein Benzene Ethylbenzene Formaldehyde Methanol Toluene Xylenes | 5.22 | 22.86 | 5.22 | 22.86 | Gas/Vapor | O (Manufacturer Data/AP-42) | . |
| | | | | | | | | | 28.71 | 125.73 | 1.46 | 6.40 | | | |
| | | | | | | | | | 6.58 | 28.80 | 1.67 | 7.32 | | | |
| | | | | | | | | | <0.01 | 0.01 | <0.01 | 0.01 | | | |
| | | | | | | | | | 0.35 | 1.55 | 0.35 | 1.55 | | | |
| | | | | | | | | | 0.02 | 0.09 | 0.02 | 0.09 | | | |
| | | | | | | | | | 0.30 | 1.30 | 0.30 | 1.30 | | | |
| | | | | | | | | | 0.18 | 0.80 | 0.18 | 0.80 | | | |
| | | | | | | | | | 0.02 | 0.07 | 0.02 | 0.07 | | | |
| | | | | | | | | | <0.01 | 0.01 | <0.01 | 0.01 | | | |
| | | | | | | | | | 4.18 | 18.29 | 0.42 | 1.83 | | | |
| | | | | | | | | | 0.09 | 0.39 | 0.09 | 0.39 | | | |
| | | | | | | | | | 0.01 | 0.06 | 0.01 | 0.06 | | | |
| | | | | | | | | | 0.01 | 0.03 | 0.01 | 0.03 | | | |
| CM-1002 | Vert St Rain CP | Same | Same | N/A | Oxid. Cat. | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ Acetaldehyde Acrolein Benzene Ethylbenzene Formaldehyde Methanol Toluene Xylenes | 5.22 | 22.86 | 5.22 | 22.86 | Gas/Vapor | O (Manufacturer Data/AP-42) | . |
| | | | | | | | | | 28.71 | 125.73 | 1.46 | 6.40 | | | |
| | | | | | | | | | 6.58 | 28.80 | 1.67 | 7.32 | | | |
| | | | | | | | | | <0.01 | 0.01 | <0.01 | 0.01 | | | |
| | | | | | | | | | 0.35 | 1.55 | 0.35 | 1.55 | | | |
| | | | | | | | | | 0.02 | 0.09 | 0.02 | 0.09 | | | |
| | | | | | | | | | 0.30 | 1.30 | 0.30 | 1.30 | | | |
| | | | | | | | | | 0.18 | 0.80 | 0.18 | 0.80 | | | |
| | | | | | | | | | 0.02 | 0.07 | 0.02 | 0.07 | | | |
| | | | | | | | | | <0.01 | 0.01 | <0.01 | 0.01 | | | |
| | | | | | | | | | 4.18 | 18.29 | 0.42 | 1.83 | | | |
| | | | | | | | | | 0.09 | 0.39 | 0.09 | 0.39 | | | |
| | | | | | | | | | 0.01 | 0.06 | 0.01 | 0.06 | | | |
| | | | | | | | | | 0.01 | 0.03 | 0.01 | 0.03 | | | |

| | | | | | | | | | | | | | | |
|---------|--------------------|------|------|-----|---------------|-----|-----|--|--|--|---|----------------|-----------------------------|--|
| CM-2001 | Vert St Rain CP | Same | Same | N/A | Oxid. Cat. | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ Acetaldehyde Acrolein Benzene Ethylbenzene Formaldehyde Methanol Toluene Xylenes | 2.61 14.37 5.75 <0.01 0.16 0.01 0.13 0.08 0.01 <0.01 1.36 0.04 0.01 <0.01 | 11.44 62.93 25.17 0.01 0.69 0.01 0.01 0.35 0.03 <0.01 5.95 0.17 0.03 0.01 | 2.61 11.44 62.93 25.17 0.01 0.16 0.01 0.13 0.08 0.01 <0.01 5.95 0.16 0.04 0.01 <0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-711 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.24 0.47 0.04 0.01 0.05 <0.01 0.01 | 1.03 2.07 0.17 0.06 0.23 0.02 0.06 | 0.24 1.03 2.07 0.17 0.04 0.01 0.05 <0.01 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-771 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.85 1.70 0.14 0.05 0.19 0.02 0.05 | 3.71 7.42 0.61 0.21 0.84 0.07 0.20 | 0.85 1.70 0.14 0.05 0.19 0.02 0.05 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| DH-001 | Vert St | Same | Same | N/A | Flare | N/A | N/A | Benzene Toluene Xylenes n-Hexane | 0.04 0.12 0.06 0.12 | 0.18 0.52 0.24 0.53 | 0.04 0.12 0.06 0.12 | Gas / Vapor | GRI- GLYCalc | |
| RB-001 | Vert St | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.18 0.15 0.01 <0.01 0.01 <0.01 <0.01 | 0.78 0.66 0.04 0.02 0.06 <0.01 0.01 | 0.18 0.15 <0.01 <0.01 <0.01 <0.01 0.01 | Gas/Vapor | AP-42 | |
| FL-991 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ | 0.11 0.09 0.01 0.01 0.01 <0.01 | 0.48 0.40 0.03 0.03 0.04 <0.01 | 0.11 0.09 0.01 0.01 0.01 <0.01 | Gas/Vapor | AP-42 | |

| | | | | | | | | | | | | | | | |
|---------|--------------------|------|------|-----|------|-----|-----|---|--|--|--|--|-----------|--|--|
| TNK-001 | Fugitives | Same | Same | N/A | VRU | N/A | N/A | VOC HAP | 109.38 10.33 | 479.09 45.24 | 2.19 0.21 | 9.58 0.90 | Gas/Vapor | HYSYS Run | |
| FUG-001 | Fugitives | Same | Same | N/A | None | N/A | N/A | VOC HAP | 8.72 0.10 | 38.21 0.45 | 8.72 0.10 | 38.21 0.45 | Gas/Vapor | EPA Protocol Leak Emission Estimates | |
| H-2711 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.24 0.04 0.01 0.05 <0.01 0.01 | 1.03 0.17 0.06 0.23 0.02 0.06 | 0.24 0.47 0.04 0.01 0.05 <0.01 0.01 | 1.03 2.07 0.17 0.06 0.23 0.02 0.06 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-3711 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.24 0.04 0.01 0.05 <0.01 0.01 | 1.03 0.17 0.06 0.23 0.02 0.06 | 0.24 0.47 0.04 0.01 0.05 <0.01 0.01 | 1.03 2.07 0.17 0.06 0.23 0.02 0.06 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-4711 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.72 0.72 0.34 0.03 0.23 <0.01 <0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | 0.72 0.72 0.34 0.03 0.23 <0.01 <0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-5711 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.72 0.72 0.34 0.03 0.23 <0.01 <0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | 0.72 0.72 0.34 0.03 0.23 <0.01 <0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-6711 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.72 0.72 0.34 0.03 0.23 <0.01 <0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | 0.72 0.72 0.34 0.03 0.23 <0.01 <0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |

| | | | | | | | | | | | | | | | |
|--------|--------------------|------|------|-----|------|-----|-----|---|--|--|--|--|-----------|--------------------------------|--|
| H-4712 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.26 0.26 0.12 0.09 0.09 0.02 0.01 | 1.16 1.16 0.55 0.38 0.38 0.02 0.01 | 0.26 0.26 0.12 0.09 0.09 0.02 0.01 | 1.16 1.16 0.55 0.38 0.38 0.02 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-6712 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.26 0.26 0.12 0.09 0.09 0.02 0.01 | 1.16 1.16 0.55 0.38 0.38 0.02 0.01 | 0.26 0.26 0.12 0.09 0.09 0.02 0.01 | 1.16 1.16 0.55 0.38 0.38 0.02 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-742 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.22 0.18 0.01 0.02 0.02 0.01 0.01 | 0.96 0.81 0.05 0.07 0.07 0.01 0.01 | 0.22 0.18 0.01 0.02 0.02 0.01 0.01 | 0.96 0.81 0.05 0.07 0.07 0.01 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-7711 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.72 0.72 0.34 0.03 0.23 0.01 0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | 0.72 0.72 0.34 0.03 0.23 0.01 0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-8711 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.72 0.72 0.34 0.03 0.23 0.01 0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | 0.72 0.72 0.34 0.03 0.23 0.01 0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |
| H-9711 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.72 0.72 0.34 0.03 0.23 0.01 0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | 0.72 0.72 0.34 0.03 0.23 0.01 0.01 | 3.15 3.15 1.50 0.13 1.02 0.04 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) | |

| | | | | | | | | | | | | | | |
|----------|--------------------|------|------|-----|------|-----|-----|---|--|--|--|--|-----------|--------------------------------|
| H-8712 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.29 0.29 0.14 0.09 0.09 0.02 0.01 | 1.26 1.26 0.60 0.41 0.41 0.02 0.01 | 0.29 0.29 0.14 0.09 0.09 0.01 0.01 | 1.26 1.26 0.60 0.41 0.41 0.02 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) |
| H-2742 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.22 0.18 0.01 0.02 0.02 0.01 0.01 | 0.96 0.81 0.05 0.07 0.07 0.01 0.01 | 0.22 0.18 0.01 0.02 0.02 0.01 0.01 | 0.96 0.81 0.05 0.07 0.07 0.01 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) |
| H-3742 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.22 0.18 0.01 0.02 0.02 0.01 0.01 | 0.96 0.81 0.05 0.07 0.07 0.01 0.01 | 0.22 0.18 0.01 0.02 0.02 0.01 0.01 | 0.96 0.81 0.05 0.07 0.07 0.01 0.01 | Gas/Vapor | O (Manufacturer Data/AP-42) |
| D1-H-782 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 3.40 4.53 0.57 0.78 0.78 0.06 0.02 | 14.90 19.86 2.48 3.43 3.43 0.27 0.81 | 3.40 4.53 0.57 0.78 0.78 0.06 0.02 | 14.90 19.86 2.48 3.43 3.43 0.27 0.81 | Gas/Vapor | O (Manufacturer Data/AP-42) |
| D1-H-741 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.49 0.50 0.23 0.16 0.16 0.01 0.02 | 2.14 2.20 1.02 0.70 0.70 0.03 0.09 | 0.49 0.50 0.23 0.16 0.16 0.01 0.02 | 2.14 2.20 1.02 0.70 0.70 0.03 0.09 | Gas/Vapor | O (Manufacturer Data/AP-42) |
| H-751 | Vert St Rain CP | Same | Same | N/A | None | N/A | N/A | NOx CO VOC PM ₁₀ PM Total SO ₂ n-Hexane | 0.25 0.25 0.12 0.08 0.08 0.01 0.01 | 1.11 1.11 0.53 0.36 0.36 0.02 0.05 | 0.25 0.25 0.12 0.08 0.08 0.01 0.01 | 1.11 1.11 0.53 0.36 0.36 0.02 0.05 | Gas/Vapor | O (Manufacturer Data/AP-42) |

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

- ¹ Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
- ² Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed

to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

- 3 List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. DO NOT LIST H₂, H₂O, N₂, O₂, and Noble Gases.
- 4 Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- 5 Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- 6 Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).
- 7 Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m³) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO₂, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

| Emission Point ID No. (Must match Emission Units Table) | Inner Diameter (ft.) | Exit Gas | | | Emission Point Elevation (ft) | | UTM Coordinates (km) | |
|--|----------------------|------------|---|----------------|--|--|----------------------|---------|
| | | Temp. (°F) | Volumetric Flow ¹ (acfm) at operating conditions | Velocity (fps) | Ground Level (Height above mean sea level) | Stack Height ² (Release height of emissions above ground level) | Northing | Easting |
| CM-1001 | 1.5 | 856 | 32,100 | 302.7 | 1,235 | 45 (est.) | 4346.885 | 526.921 |
| CM-1002 | 1.5 | 856 | 32,100 | 302.7 | 1,235 | 45 (est.) | 4346.885 | 526.921 |
| CM-2001 | 1.5 | 857 | 16,098 | 151.8 | 1,235 | 45 (est.) | 4346.885 | 526.921 |
| H-711 | 2.5 | 550 | 115 | 0.4 | 1,235 | 15 (est.) | 4346.885 | 526.921 |
| H-771 | Unknown | 550 | Unknown | Unknown | 1,235 | 15 (est.) | 4346.885 | 526.921 |
| DH-001 | Unknown | 212 | 149 scfm | Unknown | 1,235 | Unknown | 4346.885 | 526.921 |
| RB-001 | Unknown | Unknown | Unknown | Unknown | 1,235 | Unknown | 4346.885 | 526.921 |
| FL-991 | 4.5 | Unknown | 135,011 scfm | 141.4 | 1,235 | 195.0 | 4346.885 | 526.921 |
| TNK-001 | N/A | Ambient | N/A | N/A | 1,235 | N/A | 4346.885 | 526.921 |
| FUG-001 | N/A | Ambient | N/A | N/A | 1,235 | N/A | 4346.885 | 526.921 |
| H-2711 | 2.5 | 550 | 115 | 0.4 | 1,235 | 15 (est.) | 4346.885 | 526.921 |
| H-3711 | 2.5 | 550 | 115 | 0.4 | 1,235 | 15 (est.) | 4346.885 | 526.921 |
| H-4711 | 2.5 | 530 | 79.6 acfm | 0.27 | 1,235 | 24 | 4346.885 | 526.921 |
| H-5711 | 2.5 | 530 | 79.6 acfm | 0.27 | 1,235 | 24 | 4346.885 | 526.921 |
| H-6711 | 2.5 | 530 | 79.6 acfm | 0.27 | 1,235 | 24 | 4346.885 | 526.921 |
| H-4712 | 2.5 | 550 | Unknown | Unknown | 1,235 | 15 (est) | 4346.885 | 526.921 |
| H-6712 | 2.5 | 550 | Unknown | Unknown | 1,235 | 15 (est) | 4346.885 | 526.921 |

| Table 2: Release Parameter Data | | | | | | | | |
|---|----------------------|------------|--|-------------------------------|--|--|----------------------|---------|
| Emission Point ID No. (Must match Emission Units Table) | Inner Diameter (ft.) | Exit Gas | | Emission Point Elevation (ft) | | | UTM Coordinates (km) | |
| | | Temp. (°F) | Volumetric Flow ¹ (acfm) at operating conditions | Velocity (fps) | Ground Level (Height above mean sea level) | Stack Height ² (Release height of emissions above ground level) | Northing | Easting |
| H-742 | 2.5 | 550 | Unknown | Unknown | 1,235 | 15 (est) | 4346.885 | 526.921 |
| H-7711 | 2.5 | 530 | 79.6 acfm | 0.27 | 1,235 | 24 | 4346.885 | 526.921 |
| H-8711 | 2.5 | 530 | 79.6 acfm | 0.27 | 1,235 | 24 | 4346.885 | 526.921 |
| H-9711 | 2.5 | 530 | 79.6 acfm | 0.27 | 1,235 | 24 | 4346.885 | 526.921 |
| H-8712 | 2.5 | 550 | Unknown | Unknown | 1,235 | 15 (est) | 4346.885 | 526.921 |
| H-2724 | 2.5 | 550 | Unknown | Unknown | 1,235 | 15 (est) | 4346.885 | 526.921 |
| H-3742 | 2.5 | 550 | Unknown | Unknown | 1,235 | 15 (est) | 4346.885 | 526.921 |
| D1-H-782 | 7.5 | 560 | 26,242 | 9.90 | 1,235 | 80 | 4346.885 | 526.921 |
| D1-H-741 | 2.0 | 550 | 7,714 | 40.9 | 1,235 | 20 | 4346.885 | 526.921 |
| Note: Final equipment locations not yet determined; site UTM coordinates provided for each emission source. | | | | | | | | |

¹ Give at operating conditions. Include inerts.

² Release height of emissions above ground level.

ATTACHMENT L: EMISSION UNIT DATA SHEETS

EUDS - General: Heaters

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): H-8712

1. Name or type and model of proposed affected source:

Sherwood VIII and IX Hot Oil Heater, 7.20 mmBtu/hr

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

3. Name(s) and maximum amount of proposed process material(s) charged per hour:

Emissions provided in Question 8. Unit will operate a maximum of 8,760 hours per year.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

Emissions provided in Question 8.

5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

Emissions from the combustion of natural gas.

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

Natural gas is used for fuel (estimated maximum of 60.8 million standard cubic feet per year with fuel higher heating value of 1,037 Btu/scf)

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Sulfur and ash are insignificant.

(c) Theoretical combustion air requirement (ACF/unit of fuel):

Unknown @ °F and psia.

(d) Percent excess air:

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

Zeeco Inc/GLSF 7 free Jet, 7.20 mmBtu/hr

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

Not applicable

(g) Proposed maximum design heat input: 7.20 × 10⁶ BTU/hr.

7. Projected operating schedule:

| | | | | | |
|-----------|----|-----------|---|------------|----|
| Hours/Day | 24 | Days/Week | 7 | Weeks/Year | 52 |
|-----------|----|-----------|---|------------|----|

| | | | |
|--|-------|--------|------------|
| 8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used: | | | |
| @ | 60 | °F and | 14.5 psia |
| a. NO _x | 0.29 | lb/hr | grains/ACF |
| b. SO ₂ | <0.01 | lb/hr | grains/ACF |
| c. CO | 0.29 | lb/hr | grains/ACF |
| d. PM ₁₀ | 0.09 | lb/hr | grains/ACF |
| e. Hydrocarbons | | lb/hr | grains/ACF |
| f. VOCs | 0.14 | lb/hr | grains/ACF |
| g. Pb | | lb/hr | grains/ACF |
| h. Specify other(s) | | | |
| Total HAPs | 0.013 | lb/hr | grains/ACF |
| Note: Speciated HAPs are presented in attachment J. | | lb/hr | grains/ACF |
| | | lb/hr | grains/ACF |
| | | lb/hr | grains/ACF |

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING

None proposed

RECORDKEEPING

Record operating hours

REPORTING

As required

TESTING

Not applicable

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

To be determined upon delivery

ATTACHMENT N: SUPPORTING EMISSIONS CALCULATIONS

EXAMPLE CALCULATIONS

g/hp-hr Emission Factors:

Emission Factor (g/hp-hr) * Engine Rating (hp) * 1 lb/453.6 g = lb/hr

lb/mmBtu Emission Factors:

Emission Factor (lb/mmBtu) * Engine Rating (hp) * Fuel Use (Btu/hp-hr) * 1 mmBtu/1000000 Btu = lb/hr

lb/mmscf Emission Factors:

Emission Factor (lb/mmscf) * Heater Rating (mmBtu/hr) * 1/Fuel Heating Value (Btu/scf) = lb/hr

Tons per Year (TPY) Conversion:

lb/hr * Hours/Year * 1 ton/2000 lb = TPY

MarkWest Liberty Midstream & Resources L.L.C.
 Sherwood Gas Plant

Summary of Facility-Wide Potential Emissions

Criteria Pollutant Potential Emissions

| Process/Facility | Potential Emissions (lb/hr) | | | | | |
|------------------------------------|-----------------------------|-------|-------|-----------------|-----------------|-------|
| | NO _x | CO | VOC | SO ₂ | PM ¹ | HAPs |
| Compressor Engine #1 (CM-1001) | 5.22 | 1.46 | 1.67 | 0.02 | 0.35 | 1.10 |
| Compressor Engine #2 (CM-1002) | 5.22 | 1.46 | 1.67 | 0.02 | 0.35 | 1.10 |
| Compressor Engine (CM-2001) | 2.61 | 0.73 | 1.46 | 0.01 | 0.16 | 0.46 |
| Regeneration Heater (H-711) | 0.24 | 0.47 | 0.038 | 0.0042 | 0.05 | 0.013 |
| Regeneration Heater (H-2711) | 0.24 | 0.47 | 0.038 | 0.0042 | 0.05 | 0.013 |
| Regeneration Heater (H-3711) | 0.24 | 0.47 | 0.038 | 0.0042 | 0.05 | 0.013 |
| Regeneration Heater (H-4711) | 0.72 | 0.72 | 0.342 | 0.0096 | 0.23 | 0.030 |
| Regeneration Heater (H-5711) | 0.72 | 0.72 | 0.342 | 0.0096 | 0.23 | 0.030 |
| Regeneration Heater (H-6711) | 0.72 | 0.72 | 0.342 | 0.0096 | 0.23 | 0.030 |
| Regeneration Heater (H-7711) | 0.72 | 0.72 | 0.342 | 0.0096 | 0.23 | 0.030 |
| Regeneration Heater (H-8711) | 0.72 | 0.72 | 0.342 | 0.0096 | 0.23 | 0.030 |
| Regeneration Heater (H-9711) | 0.72 | 0.72 | 0.342 | 0.0096 | 0.23 | 0.030 |
| Hot Oil Heater (H-771) | 0.85 | 1.70 | 0.138 | 0.0151 | 0.19 | 0.047 |
| Hot Oil Heater (H-4712) | 0.26 | 0.26 | 0.125 | 0.0038 | 0.09 | 0.012 |
| Hot Oil Heater (H-6712) | 0.26 | 0.26 | 0.125 | 0.0038 | 0.09 | 0.012 |
| Hot Oil Heater (H-8712) | 0.29 | 0.29 | 0.137 | 0.0042 | 0.09 | 0.013 |
| Stabilization Heater (H-742) | 0.22 | 0.18 | 0.012 | 0.0013 | 0.02 | 0.004 |
| Stabilization II Heater (H-2742) | 0.22 | 0.18 | 0.012 | 0.0013 | 0.02 | 0.004 |
| Stabilization III Heater (H-3742) | 0.22 | 0.18 | 0.012 | 0.0013 | 0.02 | 0.004 |
| DeEth HMO (D1-H-782) | 3.40 | 4.53 | 0.567 | 0.0618 | 0.78 | 0.195 |
| DeEth Regen (D1-H-741) | 0.49 | 0.50 | 0.232 | 0.0067 | 0.16 | 0.021 |
| TEG Dehydration Unit (DH-001) | -- | -- | 2.017 | -- | -- | 0.336 |
| Dehydration Unit Reboiler (RB-001) | 0.18 | 0.15 | 0.010 | 0.0011 | 0.01 | 0.003 |
| Storage Tanks | -- | -- | 3.55 | -- | -- | 0.26 |
| Emergency Flare (FL-991) | 0.11 | 0.10 | 0.006 | 0.0007 | 0.01 | -- |
| Facility Blowdowns | -- | -- | -- | -- | -- | -- |
| Fugitive Emissions (FUG-001) | -- | -- | 4.331 | -- | -- | 0.051 |
| Site Wide Emissions (lb/hr) | 24.58 | 17.74 | 18.25 | 0.22 | 3.90 | 3.86 |

¹ PM = PM₁₀ = PM_{2.5}

MarkWest Liberty Midstream & Resources L.L.C.
 Sherwood Gas Plant

Summary of Facility-Wide Potential Emissions

Criteria Pollutant Potential Emissions

| Process/Facility | Potential Emissions (tpy) | | | | | |
|------------------------------------|---------------------------|-------|-------|-----------------|-----------------|-------|
| | NOx | CO | VOC | SO ₂ | PM ¹ | HAPs |
| Compressor Engine #1 (CM-1001) | 22.86 | 6.40 | 7.32 | 0.09 | 1.55 | 4.84 |
| Compressor Engine #2 (CM-1002) | 22.86 | 6.40 | 7.32 | 0.09 | 1.55 | 4.84 |
| Compressor Engine (CM-2001) | 11.44 | 3.20 | 6.41 | 0.04 | 0.69 | 2.02 |
| Regeneration Heater (H-711) | 1.03 | 2.07 | 0.17 | 0.018 | 0.23 | 0.058 |
| Regeneration Heater (H-2711) | 1.03 | 2.07 | 0.17 | 0.018 | 0.23 | 0.058 |
| Regeneration Heater (H-3711) | 1.03 | 2.07 | 0.17 | 0.018 | 0.23 | 0.058 |
| Regeneration Heater (H-4711) | 3.15 | 3.15 | 1.50 | 0.042 | 1.02 | 0.132 |
| Regeneration Heater (H-5711) | 3.15 | 3.15 | 1.50 | 0.042 | 1.02 | 0.132 |
| Regeneration Heater (H-6711) | 3.15 | 3.15 | 1.50 | 0.042 | 1.02 | 0.132 |
| Regeneration Heater (H-7711) | 3.15 | 3.15 | 1.50 | 0.042 | 1.02 | 0.132 |
| Regeneration Heater (H-8711) | 3.15 | 3.15 | 1.50 | 0.042 | 1.02 | 0.132 |
| Regeneration Heater (H-9711) | 3.15 | 3.15 | 1.50 | 0.042 | 1.02 | 0.132 |
| Hot Oil Heater (H-771) | 3.71 | 7.42 | 0.605 | 0.0661 | 0.84 | 0.208 |
| Hot Oil Heater (H-4712) | 1.16 | 1.16 | 0.549 | 0.0167 | 0.38 | 0.053 |
| Hot Oil Heater (H-6712) | 1.16 | 1.16 | 0.55 | 0.017 | 0.38 | 0.053 |
| Hot Oil Heater (H-8712) | 1.26 | 1.26 | 0.60 | 0.018 | 0.41 | 0.057 |
| Stabilization Heater (H-742) | 0.96 | 0.81 | 0.053 | 0.0058 | 0.07 | 0.018 |
| Stabilization II Heater (H-2742) | 0.96 | 0.81 | 0.053 | 0.0058 | 0.07 | 0.018 |
| Stabilization III Heater (H-3742) | 0.96 | 0.81 | 0.053 | 0.0058 | 0.07 | 0.018 |
| DeEth HMO (D1-H-782) | 14.90 | 19.86 | 2.483 | 0.2708 | 3.43 | 0.852 |
| DeEth Regen (D1-H-741) | 2.14 | 2.20 | 1.018 | 0.0292 | 0.70 | 0.092 |
| TEG Dehydration Unit (DH-001) | -- | -- | 8.836 | -- | -- | 1.470 |
| Dehydration Unit Reboiler (RB-001) | 0.78 | 0.65 | 0.043 | 0.0047 | 0.06 | 0.015 |
| Storage Tanks | -- | -- | 9.58 | -- | -- | 0.92 |
| Emergency Flare (FL-991) | 0.50 | 0.42 | 0.028 | 0.0030 | 0.04 | -- |
| Facility Blowdowns | -- | -- | 1.816 | -- | -- | 0.087 |
| Fugitive Emissions (FUG-001) | -- | -- | 18.97 | -- | -- | 0.222 |
| Site Wide Emissions (tpy) | 107.68 | 77.68 | 75.77 | 0.97 | 17.08 | 16.75 |

¹ PM = PM₁₀ = PM_{2.5}

MarkWest Liberty Midstream & Resources L.L.C.
 Sherwood Gas Plant

Summary of Facility-Wide Potential Emissions

Hazardous Air Pollutant Potential Emissions

| Process/Facility | HAPs - Potential Emissions (lb/hr) | | | | | |
|------------------------------------|------------------------------------|--------------|----------|----------|----------|--------------|
| | Benzene | Ethylbenzene | Toluene | Xylenes | n-Hexane | Formaldehyde |
| Compressor Engine #1 (CM-1001) | 1.56E-02 | 1.41E-03 | 1.45E-02 | 6.52E-03 | 3.93E-02 | 4.18E-01 |
| Compressor Engine #2 (CM-1002) | 1.56E-02 | 1.41E-03 | 1.45E-02 | 6.52E-03 | 3.93E-02 | 4.18E-01 |
| Compressor Engine (CM-2001) | 6.91E-03 | 6.24E-04 | 6.41E-03 | 2.89E-03 | 1.74E-02 | 1.57E-01 |
| Regeneration Heater (H-711) | 1.47E-05 | -- | 2.38E-05 | -- | 1.26E-02 | 5.24E-04 |
| Regeneration Heater (H-2711) | 1.47E-05 | -- | 2.38E-05 | -- | 1.26E-02 | 5.24E-04 |
| Regeneration Heater (H-3711) | 1.47E-05 | -- | 2.38E-05 | -- | 1.26E-02 | 5.24E-04 |
| Regeneration Heater (H-4711) | 3.36E-05 | -- | 5.44E-05 | -- | 2.88E-02 | 1.20E-03 |
| Regeneration Heater (H-5711) | 3.36E-05 | -- | 5.44E-05 | -- | 2.88E-02 | 1.20E-03 |
| Regeneration Heater (H-6711) | 3.36E-05 | -- | 5.44E-05 | -- | 2.88E-02 | 1.20E-03 |
| Regeneration Heater (H-7711) | 3.36E-05 | -- | 5.44E-05 | -- | 2.88E-02 | 1.20E-03 |
| Regeneration Heater (H-8711) | 3.36E-05 | -- | 5.44E-05 | -- | 2.88E-02 | 1.20E-03 |
| Regeneration Heater (H-9711) | 3.36E-05 | -- | 5.44E-05 | -- | 2.88E-02 | 1.20E-03 |
| Hot Oil Heater (H-771) | 5.28E-05 | -- | 8.55E-05 | -- | 4.52E-02 | 1.89E-03 |
| Hot Oil Heater (H-4712) | 1.34E-05 | -- | 2.16E-05 | -- | 1.15E-02 | 4.77E-04 |
| Hot Oil Heater (H-6712) | 1.34E-05 | -- | 2.16E-05 | -- | 1.15E-02 | 4.77E-04 |
| Hot Oil Heater (H-8712) | 1.46E-05 | -- | 2.16E-05 | -- | 1.15E-02 | 4.77E-04 |
| Stabilization Heater (H-742) | 4.62E-06 | -- | 2.36E-05 | -- | 1.25E-02 | 5.21E-04 |
| Stabilization II Heater (H-2742) | 4.62E-06 | -- | 7.48E-06 | -- | 3.96E-03 | 1.65E-04 |
| Stabilization III Heater (H-3742) | 4.62E-06 | -- | 7.48E-06 | -- | 3.96E-03 | 1.65E-04 |
| DeEth HMO (D1-H-782) | 2.16E-04 | -- | 3.50E-04 | -- | 1.85E-01 | 7.73E-03 |
| DeEth Regen (D1-H-741) | 2.33E-05 | -- | 3.78E-05 | -- | 2.00E-02 | 8.34E-04 |
| TEG Dehydration Unit (DH-001) | 4.00E-02 | -- | 1.19E-01 | 5.55E-02 | 1.21E-01 | -- |
| Dehydration Unit Reboiler (RB-001) | 3.74E-06 | -- | 6.05E-06 | -- | 3.20E-03 | 1.33E-04 |
| Storage Tanks | -- | -- | -- | -- | 2.64E-01 | -- |
| Emergency Flare (FL-991) | -- | -- | -- | -- | -- | -- |
| Facility Blowdowns | -- | -- | -- | -- | -- | -- |
| Fugitive Emissions (FUG-001) | -- | -- | -- | -- | -- | -- |
| Site Wide Emissions (lb/hr) | 0.08 | 0.00 | 0.16 | 0.07 | 1.00 | 1.01 |

MarkWest Liberty Midstream & Resources L.L.C.
 Sherwood Gas Plant

Summary of Facility-Wide Potential Emissions

Hazardous Air Pollutant Potential Emissions

| Process/Facility | HAPs - Potential Emissions (tpy) | | | | | |
|------------------------------------|----------------------------------|--------------|----------|----------|----------|--------------|
| | Benzene | Ethylbenzene | Toluene | Xylenes | n-Hexane | Formaldehyde |
| Compressor Engine #1 (CM-1001) | 6.83E-02 | 6.16E-03 | 6.33E-02 | 2.86E-02 | 1.72E-01 | 1.83E+00 |
| Compressor Engine #2 (CM-1002) | 6.83E-02 | 6.16E-03 | 6.33E-02 | 2.86E-02 | 1.72E-01 | 1.83E+00 |
| Compressor Engine (CM-2001) | 3.03E-02 | 2.73E-03 | 2.81E-02 | 1.27E-02 | 7.64E-02 | 6.87E-01 |
| Regeneration Heater (H-711) | 6.43E-05 | -- | 1.04E-04 | -- | 5.51E-02 | 2.30E-03 |
| Regeneration Heater (H-2711) | 6.43E-05 | -- | 1.04E-04 | -- | 5.51E-02 | 2.30E-03 |
| Regeneration Heater (H-3711) | 6.43E-05 | -- | 1.04E-04 | -- | 5.51E-02 | 2.30E-03 |
| Regeneration Heater (H-4711) | 1.47E-04 | -- | 2.38E-04 | -- | 1.26E-01 | 5.26E-03 |
| Regeneration Heater (H-5711) | 1.47E-04 | -- | 2.38E-04 | -- | 1.26E-01 | 5.26E-03 |
| Regeneration Heater (H-6711) | 1.47E-04 | -- | 2.38E-04 | -- | 1.26E-01 | 5.26E-03 |
| Regeneration Heater (H-7711) | 1.47E-04 | -- | 2.38E-04 | -- | 1.26E-01 | 5.26E-03 |
| Regeneration Heater (H-8711) | 1.47E-04 | -- | 2.38E-04 | -- | 1.26E-01 | 5.26E-03 |
| Regeneration Heater (H-9711) | 2.31E-04 | -- | 3.74E-04 | -- | 1.98E-01 | 8.26E-03 |
| Hot Oil Heater (H-771) | 2.31E-04 | -- | 3.74E-04 | -- | 1.98E-01 | 8.26E-03 |
| Hot Oil Heater (H-4712) | 5.85E-05 | -- | 9.48E-05 | -- | 5.02E-02 | 2.09E-03 |
| Hot Oil Heater (H-6712) | 5.85E-05 | -- | 9.48E-05 | -- | 5.02E-02 | 2.09E-03 |
| Hot Oil Heater (H-8712) | 6.39E-05 | -- | 1.03E-04 | -- | 5.47E-02 | 2.28E-03 |
| Stabilization Heater (H-742) | 2.02E-05 | -- | 3.27E-05 | -- | 1.73E-02 | 7.22E-04 |
| Stabilization II Heater (H-2742) | 2.02E-05 | -- | 3.27E-05 | -- | 1.73E-02 | 7.22E-04 |
| Stabilization III Heater (H-3742) | 2.02E-05 | -- | 3.27E-05 | -- | 1.73E-02 | 7.22E-04 |
| DeEth HMO (D1-H-782) | 9.48E-04 | -- | 1.53E-03 | -- | 8.12E-01 | 3.39E-02 |
| DeEth Regen (D1-H-741) | 1.02E-04 | -- | 1.66E-04 | -- | 8.77E-02 | 3.65E-03 |
| TEG Dehydration Unit (DH-001) | 1.75E-01 | -- | 5.21E-01 | 2.43E-01 | 5.32E-01 | -- |
| Dehydration Unit Reboiler (RB-001) | 1.64E-05 | -- | 2.65E-05 | -- | 1.40E-02 | 5.85E-04 |
| Storage Tanks | -- | -- | -- | -- | 9.23E-01 | -- |
| Emergency Flare (FL-991) | -- | -- | -- | -- | -- | -- |
| Facility Blowdowns | -- | -- | -- | -- | -- | -- |
| Fugitive Emissions (FUG-001) | -- | -- | -- | -- | -- | -- |
| Site Wide Emissions (tpy) | 0.34 | 0.02 | 0.68 | 0.31 | 4.19 | 4.44 |

MarkWest Liberty Midstream & Resources L.L.C.
 Sherwood Gas Plant

**Hot Oil Heaters
 (H-8712)**

| Source Designation: | |
|--|-------------------|
| Manufacturer: | Zeeco USA, L.L.C. |
| Year Installed | 2014 |
| Fuel Used: | Natural Gas |
| Higher Heating Value (HHV) (Btu/scf): | 1,037 |
| Calculated Heat Release (mmbtu/hr) | 5.75 |
| Maximum Heat Input (mmbtu/hr) | 7.20 |
| Fuel Consumption (mmscf/hr): | 6.94E-03 |
| Potential Annual Hours of Operation (hr/yr): | 8,760 |

Criteria and Manufacturer Specific Pollutant Emission Rates

| Pollutant | Emission Factor (lb/mmbtu) ^{a,b} | Potential Emissions | |
|--------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^c | (tons/yr) ^d |
| NO _x | 0.04 | 0.288 | 1.261 |
| CO | 0.04 | 0.288 | 1.261 |
| SO ₂ | 0.0006 | 0.004 | 0.018 |
| PM Total | 0.013 | 0.094 | 0.410 |
| PM Condensable | 0.013 | 0.094 | 0.410 |
| PM ₁₀ (Filterable) | 0.013 | 0.094 | 0.410 |
| PM _{2.5} (Filterable) | 0.013 | 0.094 | 0.410 |
| VOC | 0.019 | 0.137 | 0.599 |

Hazardous Air Pollutant (HAP) Potential Emissions

| Pollutant | Emission Factor (lb/MMscf) ^a | Potential Emissions | |
|-----------------------------------|--|----------------------|------------------------|
| | | (lb/hr) ^c | (tons/yr) ^d |
| HAPs: | | | |
| 3-Methylchloranthrene | 1.80E-06 | 1.25E-08 | 5.47E-08 |
| 7,12-Dimethylbenz(a)anthracene | 1.60E-05 | 1.11E-07 | 4.87E-07 |
| Acenaphthene | 1.80E-06 | 1.25E-08 | 5.47E-08 |
| Acenaphthylene | 1.80E-06 | 1.25E-08 | 5.47E-08 |
| Anthracene | 2.40E-06 | 1.67E-08 | 7.30E-08 |
| Benz(a)anthracene | 1.80E-06 | 1.25E-08 | 5.47E-08 |
| Benzene | 2.10E-03 | 1.46E-05 | 6.39E-05 |
| Benzo(a)pyrene | 1.20E-06 | 8.33E-09 | 3.65E-08 |
| Benzo(b)fluoranthene | 1.80E-06 | 1.25E-08 | 5.47E-08 |
| Benzo(g,h,i)perylene | 1.20E-06 | 8.33E-09 | 3.65E-08 |
| Benzo(k)fluoranthene | 1.80E-06 | 1.25E-08 | 5.47E-08 |
| Chrysene | 1.80E-06 | 1.25E-08 | 5.47E-08 |
| Dibenzo(a,h) anthracene | 1.20E-06 | 8.33E-09 | 3.65E-08 |
| Dichlorobenzene | 1.20E-03 | 8.33E-06 | 3.65E-05 |
| Fluoranthene | 3.00E-06 | 2.08E-08 | 9.12E-08 |
| Fluorene | 2.80E-06 | 1.94E-08 | 8.52E-08 |
| Formaldehyde | 7.50E-02 | 5.21E-04 | 2.28E-03 |
| Hexane | 1.80E+00 | 1.25E-02 | 5.47E-02 |
| Indo(1,2,3-cd)pyrene | 1.80E-06 | 1.25E-08 | 5.47E-08 |
| Phenanthrene | 1.70E-05 | 1.18E-07 | 5.17E-07 |
| Pyrene | 5.00E-06 | 3.47E-08 | 1.52E-07 |
| Toluene | 3.40E-03 | 2.36E-05 | 1.03E-04 |
| Arsenic | 2.00E-04 | 1.39E-06 | 6.08E-06 |
| Beryllium | 1.20E-05 | 8.33E-08 | 3.65E-07 |
| Cadmium | 1.10E-03 | 7.64E-06 | 3.35E-05 |
| Chromium | 1.40E-03 | 9.72E-06 | 4.26E-05 |
| Cobalt | 8.40E-05 | 5.83E-07 | 2.55E-06 |
| Lead | 5.00E-04 | 3.47E-06 | 1.52E-05 |
| Manganese | 3.80E-04 | 2.64E-06 | 1.16E-05 |
| Mercury | 2.60E-04 | 1.81E-06 | 7.91E-06 |
| Nickel | 2.10E-03 | 1.46E-05 | 6.39E-05 |
| Selenium | 2.40E-05 | 1.67E-07 | 7.30E-07 |
| Polycyclic Organic Matter: | | | |
| Methylnaphthalene (2-) | 2.40E-05 | 1.67E-07 | 7.30E-07 |
| Naphthalene | 6.10E-04 | 4.24E-06 | 1.86E-05 |
| Total HAP | | 1.31E-02 | 5.74E-02 |

^a Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

^b Nox, CO, PM, and VOC emission factors from vendor guarantee.

^c Emission Rate (lb/hr) = Rated Capacity (MMbtu/hr) × Emission Factor (lb/MMbtu).

^d Annual Emissions (tons/yr)_{Potential} = (lb/hr)_{Emissions} × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

ATTACHMENT P: PUBLIC NOTICE

MarkWest Liberty Midstream & Resources L.L.C. has published a public notice in *The Herald Record* newspaper, headquartered in Doddridge County, WV. This paper serves the geographical area surrounding the proposed facility.

The affidavit issued by the paper showing the date of publication and the actual text is attached following the proposed text:

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that MarkWest Liberty Midstream & Resources L.L.C. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Class II Administrative Update for a 6.35 mmbtu/hr stabilization heater at the Sherwood Gas Plant located at 218 Swisher Lane, West Union, WV 26456 in Doddridge County, West Virginia. The latitude and longitude coordinates in decimal degrees are: 39.275987, -80.685308.

The applicant estimates the increased potential to discharge the following Regulated Air Pollutants will be:

| | |
|------------------------------------|--------------|
| Nitrogen Oxides (NO _x) | 0.10 tons/yr |
| Carbon Monoxide (CO) | 0.10 tons/yr |
| Volatile Organic Compounds (VOC) | 0.05 tons/yr |
| Particulate Matter (PM) | 0.03 tons/yr |
| Sulfur Dioxide (SO ₂) | 0.01 tons/yr |
| Total HAPs | 0.04 tons/yr |

Startup of operation is planned to begin in June 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the 8th day of February, 2017

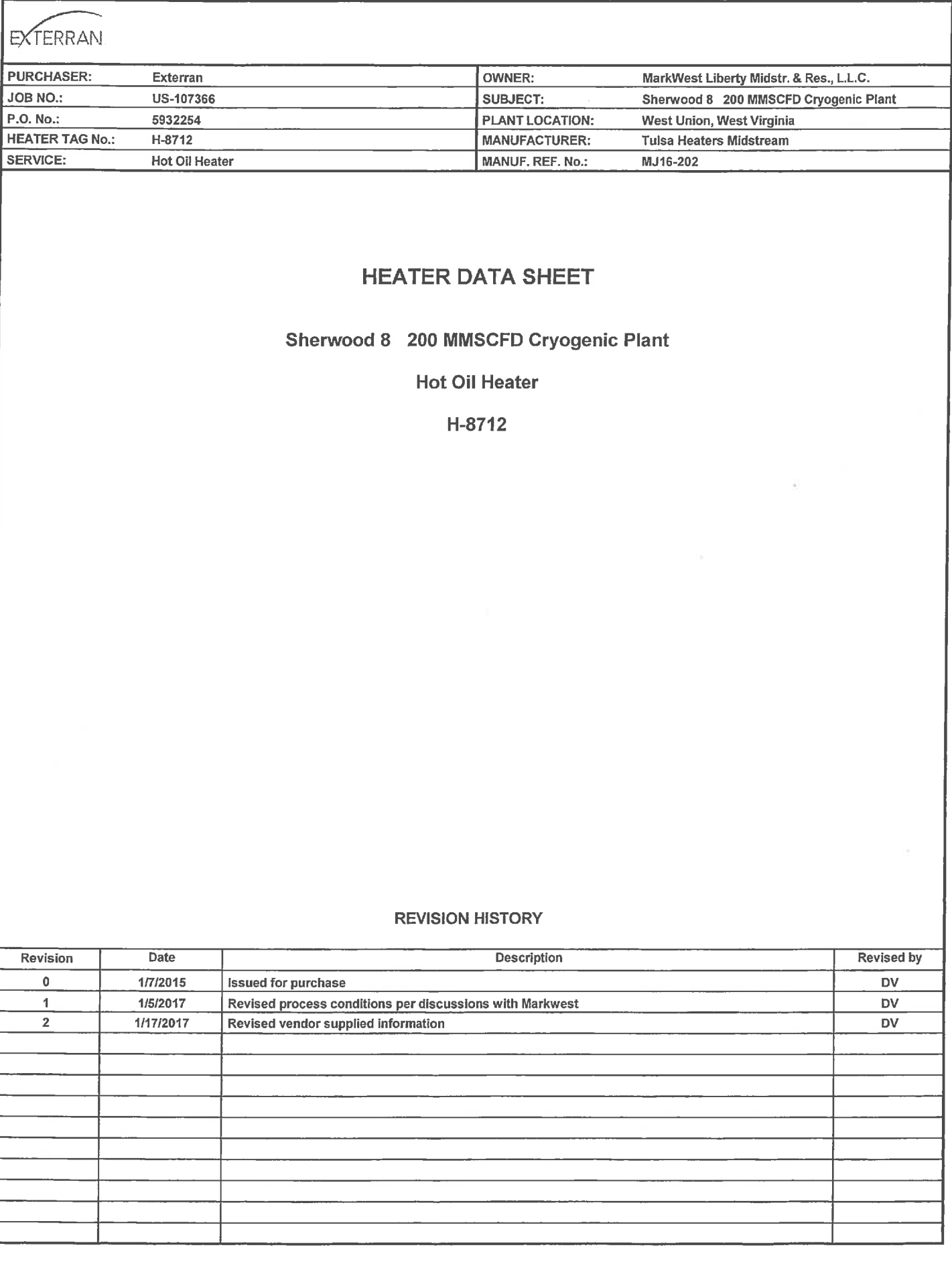
By: MarkWest Liberty Midstream & Resources L.L.C.
Leanne Meyer
VP EH&S
1515 Arapahoe St.
Tower 1, Suite 1600
Denver, CO. 80202-2137

APPLICATION FEE

Per 45CSR13 a fee of \$300 must be submitted with a Class II Administrative Amendment.

APPENDIX A: SUPPORT DOCUMENTS

Heater Specification Sheets.

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|---|-----------------|-----------|-----------------|---|--|
| 1 | PURCHASER: | Exterran | OWNER: | MarkWest Liberty Midstr. & Res., L.L.C. | |
| 2 | JOB NO.: | US-107366 | SUBJECT: | Sherwood 8 200 MMSCFD Cryogenic Plant | |
| 3 | P.O. No.: | 5932254 | PLANT LOCATION: | West Union, West Virginia | |
| 4 | HEATER TAG No.: | H-8712 | SERVICE: | Hot Oil Heater | |

INSTRUCTIONS TO VENDOR

The heater vendor shall supply the following items in accordance with the process design requirements summarized by this datasheet and the Exterran Specification ENG-SPC-0015 *Direct Fired Heaters*:

- (1) Heater
- (2) Forced Draft Combustion System
- (3) Heater/Combustion Controls System
- (4) Heater and Combustion System Instrumentation
- (5) Fuel Skid
- (6) Combustion Air Blower Fan and Motor
- (7) Hot Oil Circulation Pump Skid & Instrumentation
- (8) Hot Oil Expansion Tank

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HEATER DATA SHEET

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| 4 | HEATER TAG No.: | H-8712 | SERVICE: | Hot Oil Heater | |
| 5 | PROCESS DESIGN CONDITIONS (Note 1) | | | | |
| 6 | FLUID | THERMINOL 55 | | | |
| 7 | OPERATING CASE | DESIGN | Normal | | |
| 8 | ABSORBED DUTY (MMbtu/hr) | 5.75 | 5.23 | | 1 |
| 9 | FIRED DUTY (MMbtu/hr) | 6.78 | 6.07 | | 1 |
| 10 | INLET CONDITIONS: | | | | |
| 11 | FLOW RATE (lbs/hr) | 117,996 | 107,797 | | 1 |
| 12 | OPERATING TEMPERATURE (°F) | 270 | 270 | | |
| 13 | OPERATING PRESSURE (psig) | 95.0 | 95.0 | | |
| 14 | DENSITY (lbs/ft ³) | 49.70 | 49.70 | | |
| 15 | MOLECULAR WEIGHT | 320.00 | 320.00 | | |
| 16 | SPECIFIC HEAT (btu/lb-°F) | 0.550 | 0.550 | | |
| 17 | THERMAL CONDUCTIVITY (btu/hr-ft-°F) | 0.0667 | 0.0667 | | |
| 18 | VISCOSITY (cP) | 1.6520 | 1.6520 | | |
| 19 | OUTLET CONDITIONS: | | | | |
| 20 | FLOW RATE (lbs/hr) | 117,996 | 107,797 | | 1 |
| 21 | OPERATING TEMPERATURE (°F) | 355 | 355 | | 1 |
| 22 | OPERATING PRESSURE (psig) | 78.0 | 80.0 | | 1 |
| 23 | DENSITY (lbs/ft ³) | 47.60 | 47.60 | | 1 |
| 24 | MOLECULAR WEIGHT | 320.00 | 320.00 | | 1 |
| 25 | SPECIFIC HEAT (btu/lb-°F) | 0.590 | 0.590 | | 1 |
| 26 | THERMAL CONDUCTIVITY (btu/hr-ft-°F) | 0.0635 | 0.0635 | | 1 |
| 27 | VISCOSITY (cP) | 0.9190 | 0.9190 | | 1 |
| 28 | PRESSURE DROP (Allow.) (psi) | 30.0 | -----> | | |
| 29 | PRESSURE DROP (Calc.) (psi) | 17 | 15 | | 1 |
| 30 | FOULING FACTOR (hr-ft ² -°F/btu) | 0.002 | -----> | | |
| 31 | FLUID BULK VELOCITY (ft/s) | 10 | 9 | | 1 |
| 32 | FLUID MASS VELOCITY (lbs/s-ft ²) | 477 | 436 | | 1 |
| 33 | AVG. RAD. SECT. FLUX DENSITY (btu/hr-ft ²) | 12,900 | 11,880 | | 1 |
| 34 | MAX. RAD. SECT. FLUX DENSITY (btu/hr-ft ²) | 20,000 | 18,400 | | 1 |
| 35 | MAX. FILM TEMPERATURE (°F) | 442 | 441 | | 1 |
| 36 | MAX. TUBE METAL TEMPERATURE (°F) | 503 | | | 1 |
| 37 | EXCESS AIR (%) | 15.0% | -----> | | |
| 38 | RADIATION LOSSES (% of H.R.) (LHV) | 1.5% | 1.5% | | 1 |
| 39 | EFFICIENCY (Calc.) (LHV) | 84.8% | 85.9% | | 1 |
| 40 | EFFICIENCY (Guar.) (LHV) | 79.8% | 79.8% | | 1 |
| 41 | FLUE GAS TEMPERATURE LEAVING: | | | | |
| 42 | RADIANT SECTION (°F) | 1,524 | 1,476 | | 1 |
| 43 | CONVECTION SECTION (°F) | 586 | 547 | | 1 |
| 44 | FLUE GAS QUANTITY (lbs/hr) | 6,609 | 5,931 | | 1 |
| 45 | DRAFT/PRESSURE AT ARCH (in w.c.) | +1 | | | |
| 46 | DRAFT/PRESSURE AT BURNER (in w.c.) | +6 | | | |
| 47 | HEATER COIL DESIGN REQUIREMENTS | | | | |
| 48 | DESIGN PRESS. / TEMP. (psig / °F) | 150 | / 550 | | |
| 49 | CODE REQUIREMENTS | ASME Section VIII Division 1 | | | |
| 50 | ASME STAMP / NATIONAL BOARD No. | Yes / Yes | | | |
| 51 | RADIOGRAPHY | Per Code or 100% of 10% of all pressure welds (whichever is greater) | | | |
| 52 | NOTES: | | | | |
| 53 | * To be provided by the heater vendor. | | | | |
| 54 | (1) The heater vendors shall base its heater design on the above Standard Plant Design conditions. | | | | |
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| 4 | HEATER TAG No.: | H-8712 | SERVICE: | Hot Oil Heater |

FUEL CHARACTERISTICS (Note 1)

| | | | | | | |
|----|-----------------------------|---------------|------------|--|--|--|
| 6 | | FUEL GAS 1 | FUEL GAS 2 | | | |
| 7 | COMPOSITION | | | | | |
| 8 | Methane (Mole %) | 99.33 | 80.22 | | | |
| 9 | Ethane (Mole %) | 0.41 | 15.26 | | | |
| 10 | Propane (Mole %) | 0.02 | 2.39 | | | |
| 11 | Butane (Mole %) | | 0.17 | | | |
| 12 | Pentane (Mole %) | | | | | |
| 13 | Hexane (Mole %) | | | | | |
| 14 | Nitrogen (Mole %) | 0.22 | 1.49 | | | |
| 15 | Carbon Dioxide (Mole %) | 0.02 | 0.47 | | | |
| 16 | Water (Mole %) | | | | | |
| 17 | | 100.00 | 100.00 | | | |
| 18 | FUEL LHV (btu/scf) | 910.1 | 1,037.4 | | | |
| 19 | MOLECULAR WEIGHT | 16.14 | 19.25 | | | |
| 20 | TEMPERATURE (°F) | 100 | 100 | | | |
| 21 | PRESSURE (Available) (psig) | 150 | 150 | | | |
| 22 | PRESSURE (Required) (psig) | 30 | 30 | | | |
| 23 | | | | | | |
| 24 | REQUIRED EMISSIONS | (Notes 1 & 2) | | | | |
| 25 | NO _x (lbs/MMbtu) | 0.04 | | | | |
| 26 | CO (lbs/MMbtu) | 0.04 | | | | |
| 27 | UHC (lbs/MMbtu) | 0.007 | | | | |
| 28 | VOC (lbs/MMbtu) | 0.019 | | | | |
| 29 | SPM10 (lbs/MMbtu) | 0.013 | | | | |

COMBUSTION SYSTEM INFORMATION

| | | |
|----|------------------------------|-------------------------------|
| 31 | COMBUSTION CONTROLS MANUF. | DAIGLE AUTOMATION, Inc. |
| 32 | FUEL SKID MANUF. | DAIGLE AUTOMATION, Inc. |
| 33 | BURNER MANUF. / BURNER MODEL | ZEECO, Inc. / GLSF 7 Free Jet |
| 34 | BURNER QUANTITY | ONE (1) |
| 35 | COMBUSTION SYSTEM | FORCED DRAFT |

SITE DATA / UTILITIES

| | | |
|----|---------------------------------|--|
| 37 | ELEVATION A.S.L. (ft) | 0 - 7000 (design basis) |
| 38 | ELEVATION A.S.L. (ft) | 1300 (plant site) |
| 39 | TEMPERATURE (min/avg/max) (°F) | -20/60/100 |
| 40 | WIND LOAD | ASCE 7-05, 100 MPH, EC:C, OC:III, WIF:1.15, TF:1.0 |
| 41 | SEISMIC ZONE | ASCE 7-05, Ss:0.5, S1:0.15, SC:D, OC:III, SUG:II, SIF:1.25 |
| 42 | HAZARDOUS AREA CLASSIFICATION | Class 1, Division II, Group C, D, Temp. Class T3 |
| 43 | POWER | 480V / 3PH / 60Hz & 120V / 1PH / 60Hz |
| 44 | MOTOR STARTERS & VFD | Supplied By Others (Not By The Heater Vendor) |
| 45 | INSTRUMENT AIR PRESSURE (psig) | 60 / 80 / 100 (min / norm / max) |
| 46 | INSTRUMENT AIR TEMPERATURE (°F) | 60 / 80 / 100 (min / norm / max) |

| | |
|----|--|
| 47 | NOTES: |
| 48 | * To be provided by the heater vendor. |
| 49 | (1) The above specified fuel compositions define the upper and lower limits of the fuels expected. The heater/burner vendors |
| 50 | base their design and emissions on the above specified fuels or any mixture between the two. |
| 51 | (2) The emissions guarantees shall applicable in the range between 50% and 100% of the heat release. |
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| 4 | HEATER TAG No.: | H-8712 | SERVICE: | Hot Oil Heater | |
| 5 | ADDITIONAL NOTES | | | | |
| 6 | SURFACE PREPARATION AND PAINT: | | | | |
| 7 | See Exterran Specification ENG-SPC-0015 Direct Fired Heaters | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | COMBUSTION AIR BLOWER / MOTOR: | | | | |
| 11 | Blower / Motor Type | Direct Drive | | | |
| 12 | Blower Motor HP | 5 | | | 2 |
| 13 | Blower Motor RPM | 3600 | | | |
| 14 | Blower Motor Requirements | Premium Efficiency, TEFC, NEMA Design, VFD Compliant, Insulation F, | | | |
| 15 | | Service Factor 1.15 with understanding that SF =1.0 if the motor is VFD controlled. | | | |
| 16 | | Class I, Division 2, Group C, D, Temperature Class T3 (stamped on the nameplate) | | | |
| 17 | Blower Motor Power Requirements | 480V / 3PH / 60H | | | |
| 18 | | | | | |
| 19 | HOT OIL CIRCULATION PUMP & EXPANSION TANK SKID: | | | | |
| 20 | Max. Press. Drop Across Skid | 5 psi | | | |
| 21 | Circulation Pumps & Motors | | | | |
| 22 | Tag No. | P-8712A & P-8712B | | | |
| 23 | Number of Pumps | Two (one operating at 100% and the other as spare) | | | |
| 24 | Pump Manufacturer | Dean or Equivalent | | | |
| 25 | Capacity | 296 GPM @ 223 feet TDH | | | 1 |
| 26 | Minimum Flow | 54 GPM | | | 1 |
| 27 | NPSHr | 8.7 ft | | | 1 |
| 28 | Shutoff Pressure / Head | 93 psi / 274 feet | | | 2 |
| 29 | Type | Centrifugal, Centerline Mounted | | | |
| 30 | Shaft Seal Type | Mechanical Seal / Fin Air Cooled and API Plan 52 | | | |
| 31 | | Vendor to note that there is no water cooling available | | | |
| 32 | Hot Oil Pump Motor HP | 25 | | | 1 |
| 33 | Hot Oil Pump Motor RPM | 3600 | | | |
| 34 | Blower Motor Requirements | Premium Efficiency, TEFC, NEMA Design, VFD Compliant, Insulation F, | | | |
| 35 | | Service Factor 1.15 | | | |
| 36 | | Class I, Division 2, Group C, D, Temperature Class T3 (stamped on the nameplate) | | | |
| 37 | Hot Oil Pump Motor Power Requirements | 480V / 3PH / 60H | | | |
| 38 | | | | | |
| 39 | Expansion Tank | | | | |
| 40 | Tag No. | V-8712 | | | |
| 41 | Capacity / Size | 1800 Gallons / 48" O.D. x 18' S/S x 0.375" W.T. | | | |
| 42 | Code Requirements | ASME Section VIII Division 1 | | | |
| 43 | ASME Stamp / National Board No. | Yes / Yes | | | |
| 44 | Design Pressure & Temperature | 50 psig / Full Vacuum @ 500°F | | | |
| 45 | MDMT | -20°F @ 50 psig / Full Vacuum | | | |
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